INTERACTIVE DISPLAY SYSTEMS

TECHNICAL FIELD

The present disclosure is generally related to interactive display systems and, more particularly, is related to touch-sensitive systems.

BACKGROUND

Interactive electronic whiteboard systems, for example touch-sensitive systems, are popular communication tools frequently used in classroom settings as well as in business meetings. Commercially available interactive electronic whiteboard systems include the Webster™ Touch Sensitive and Walk-and-Talk™ systems available from PolyVision Corporation. This exemplary system generally includes a computer connected to a touch sensitive display and a projector. Data typically displayed on the computer's monitor can be projected onto the touch sensitive whiteboard. A user touches the touch sensitive whiteboard to interact with the projected data and control the presentation of the data, for example by controlling a software application being executed on the computer. The touch sensitive whiteboard operates as a dynamic user interface for the associated computer allowing the user to interact directly with displayed data and to publish the interaction to other computers networked with the interactive whiteboard system. Data that is written on the surface of the touch sensitive display can be incorporated into the projected data, and all of the data can be electronically captured, stored, or manipulated. As a result, a user in one location can provide an interactive presentation to local and remote audiences.

The touch sensitive whiteboard of commercially available interactive whiteboard systems is generally mounted onto a wall surface in close proximity to a power outlet needed to provide power to the display. In some interactive whiteboard systems, for example the Walk-and-Talk™ systems also available from PolyVision Corporation, the

touch sensitive display may be mounted to the wall surface on a slidable track system. The slidable track system also provides power to the display so that the display can be moved, for example horizontally along the wall. Unfortunately, movement of the touch sensitive display is limited by the requirement for a power outlet.

Other interactive whiteboard systems include a whiteboard mounted on a movable stand. See for example U.S. Patent No. 5,903,252 to Ogata. Generally, the display is mounted on a stand having wheels so that the whiteboard can be moved within a room. Adjusting the height of the display is difficult due in part to the weight of the display and typically requires two individuals. In addition, a lengthy power cord and connection cables are required to position the display away from a power outlet. Moreover, the additional power cord length can obstruct the user's movement during a presentation.

Thus, there is a need for mobile interactive electronic systems.

There is another need for self-powered interactive electronic systems.

There is still another need for an electronic whiteboard apparatus for facilitating cordless repositioning.

SUMMARY OF THE DISCLOSURE

Embodiments of the present invention provide interactive display systems, including, but not limited to touch-sensitive display systems. Briefly described, one embodiment of the present disclosure, among others, provides a mobile interactive display system. The interactive display system can include an electronic whiteboard, for example a touch-sensitive electronic whiteboard. In some embodiments, the disclosed interactive display systems have an increased range of mobility due in part to the self-powered support stand. By incorporating a self-contained power supply into the interactive display system, the mobility of the system is no longer limited to the length of a power cord or the location of a power outlet. Accordingly, embodiments of the present disclosure provide interactive display systems that can be moved about a room virtually without limitation. Exemplary systems of the present disclosure include but are not limited to an interactive display, for example a touch sensitive display, mounted on a support frame, for example a mobile support frame, having at least one vertical

positioning element. The system can optionally include the following: a computer operably connected to the interactive display, a projector, a stylus and/or an eraser.

Another embodiment of the present disclosure provides an adjustable and mobile support frame for an interactive display. An exemplary support frame includes a base element and at least one support extending vertically from the base element. The support can be configured to receive an interactive display, and the support frame can optionally include a power supply, for example a rechargeable power supply. The power supply can be attached to the support frame or housed within an element of the support frame. The mobility of the support frame can be facilitated by attaching wheels, rollers, castors, treads or the like to the base element.

In still another embodiment, the vertical position of the interactive display can be adjusted using at least one vertical positioning element of the support frame. The vertical positioning element includes but is not limited to hydraulic or pneumatic devices such as pistons and gas springs. The vertical positioning element can provide a counterbalancing force to the weight of the touch-sensitive display on the support frame so that the vertical position of the touch-sensitive display can be adjusted by applying less than about 25 pounds of force, preferably about 1.0 ounce to about 3 pounds of force. In another embodiment, a user can adjust the height of the touch-sensitive display using finger pressure.

Yet another embodiment provides a self-powered, mobile interactive display system including for example, an electronic whiteboard. Embodiments of the disclosed interactive display systems can be in wireless communication with one or more computers, and the interactive displays can be mounted onto a vertically adjustable support frame. An integrated or peripheral power supply of the support frame can power the interactive display. For example, an interactive electronic whiteboard system can be moved without the limitations of a power cord or proximity to a power outlet.

Other systems, methods, features, and advantages of the present invention will be or become apparent to one with skill in the art upon examination of the following drawings and detailed description. It is intended that all such additional systems, methods, features, and advantages be included within this description, be within the scope of the present invention, and be protected by the accompanying claims.

BRIEF DESCRIPTION OF THE DRAWINGS

Many aspects of the invention can be better understood with reference to the following drawings. The components in the drawings are not necessarily to scale, emphasis instead being placed upon clearly illustrating the principles of the present invention. Moreover, in the drawings, like reference numerals designate corresponding parts throughout the several views.

Figure 1A is a front view of an exemplary interactive display system.

Figure 1B is representation of another exemplary interactive display system.

Figure 2 is a diagram of an exemplary support frame.

Figure 3A is a representation of an exemplary positioning element.

Figure 3B is a representation of an upper portion of the exemplary positioning element shown in Figure 3A.

Figure 3C is a representation of a center portion of the exemplary positioning element shown in Figure 3A.

Figure 4A is a representation of an exemplary embodiment including a power supply as seen from the front.

Figure 4B is a representation of an exemplary embodiment including a power supply as seen from the behind.

Figure 5 is a diagram of an alternative embodiment of the disclosed support frame.

Figure 6 is a diagram of another embodiment of the disclosed support frame.

Figure 7 is a diagram of still another embodiment of the disclosed support frame.

DETAILED DESCRIPTION OF THE EMBODIMENTS

Embodiments of the present disclosure are generally directed to interactive display systems **110** including interactive electronic whiteboard systems, for example touch-sensitive electronic whiteboard systems. Suitable interactive displays include touch-sensitive electronic whiteboards **112**, rear-projection displays, laser tracking displays, sonic tracking displays, optical capture displays, televisions, plasma screen displays, LCDs, and eInk displays which use oil-filled capsules in which particles of

titanium dioxide are suspended. eInk displays use an electrical charge conferred to selected particles (which are white) to create an image.

1. Mobile Interactive Display Systems with Vertical Adjustment Means

One of the several embodiments described herein includes an interactive display **112**, for example an electronic whiteboard in combination with a support frame **200**, for example a mobile support frame. Support frame **200** includes mobile elements **206** such as wheels, treads, or rollers for facilitating repositioning of the interactive display system, but it will be appreciated that any means for reducing friction between the support stand and a floor surface can be utilized. Exemplary support frames include at least one vertical positioning element **212**, for example a hydraulic or pneumatic device including, but not limited to, gas springs or pistons. The positioning element **212** can be housed within a channel or recess **203** of support **202**. In one embodiment, positioning element **212** can be a gas spring encased in an extruded channel **203** of vertical support **202**. Encasing positioning element **212** within an extruded channel avoids the need for additional fasteners for securing positioning element **212** to support **202**. Alternatively, the positioning element **212** can itself be a vertical support **202** as shown in Figure 7.

Generally, the positioning device **212** can be calibrated to counterbalance the weight of an interactive display **112**, for example, a touch-sensitive display, mounted to the support frame **200**. By counterbalancing the weight of the attached interactive display panel **112**, the vertical position of the display **112** can be adjusted by applying less than about 25 pounds of force, preferably about 1.0 ounce to about 3 pounds of force, for example, finger pressure. Once the display **112** is placed at a desired distance from the floor, the display **112** can be locked in place, for example by tightening knob **214** which secures the positioning element in place.

2. Self-Powered Interactive Display System

Another embodiment of the present disclosure provides a cordless and mobile interactive display system. The term "cordless" means self-powered, for example, not requiring a power cord connected to a power outlet. The cordless interactive display system can include an interactive display, for example, an electronic whiteboard **112**, mounted on a mobile support frame **200**. The mobile support frame **200** includes a power source or power supply **108**, for example a rechargeable power supply. The self-powered mobile support frame enables the interactive electronic whiteboard to be positioned in a room or space without limitation by the length of a power cord or the position of a power outlet, for example a power outlet in a wall.

3. Self-Powered Interactive Display System with Vertical Adjustment Means

Still another embodiment provides a interactive display system including an interactive display **112** mounted to a self-powered, mobile support frame **200** wherein the support frame can be vertically positioned by actuating at least one vertical positioning element **212**, for example a hydraulic or pneumatic device including but not limited to gas springs or pistons. The positioning element **212** can be housed within a vertical support **200**, for example within a channel or recess. Alternatively, the positioning element **212** can itself be a vertical support as shown in Figure 7. Generally, the positioning device **212** can be calibrated to counterbalance the weight of an interactive display, for example a touch-sensitive display, mounted to the support frame **200**. By counterbalancing the weight of the attached interactive display panel **112**, the vertical position of the display **112** can be adjusted by applying less than about 25 pounds of force, preferably about 1.0 ounce to about 3 pounds of force, for example, finger pressure. Once the display **112** is placed at a desired distance from the floor, the display **112** can be locked in place, for example by tightening knob **214** which secures the positioning element in place.

4. Interactive Display Systems with a Communication Means

It will be appreciated that any of the disclosed embodiments described herein can optionally include communication device **122**. For example, one interactive display system includes an interactive display **112** such as an electronic whiteboard mounted on a mobile stand **200**, wherein the mobile stand **200** includes a vertical positioning element **212**. The

vertical positioning element **212** includes for example, a pneumatic or hydraulic piston such as gas springs. The system further includes communication device **122**. Communication device **122** includes, but is not limited to, a wireless communication device.

In still another embodiment, a mobile, self-powered interactive display system as described herein can include communication device **122**. In this embodiment, the interactive display **112** is mounted on a mobile support frame **200**. Yet another embodiment provides a mobile display system including an interactive display **112** mounted on a mobile support frame **200** having at least one vertical positioning element **212**, a communication device **122**, and a power source **108**, for example a rechargeable power source including, but not limited to, standard alkaline batteries.

Turning now to the Figures, Figures 1A and 1B depict exemplary interactive display system **110** having communication device **122**, for example a wireless communication device, for receiving or transmitting data. In one embodiment, a user can use a remote control device to actuate a function of the interactive display system **110** including controlling an operating system by wirelessly transmitting data to communication device **122**. In another embodiment, communication device **122** can transmit coordinate data to processing device **118**, for example via wireless transmission. The remote control device can be conveniently stored on bracket **124**. Communication device **122** includes infrared transceivers, radio wave transceivers, telephony devices and the like. The interactive display system **110** can communicate with a distributed computer network **105**, for example a local area network, wide area network, or the Worldwide Web, using standard protocols including but not limited to any type of radio frequency (802.11 network, whether 802.11b, 802.11a, dual-band, etc.) infrared, or other means.

The exemplary interactive display system **110**, Figures 1A and 1B, optionally includes: a projector **116** for projecting data onto a display surface **114**, a computing device **118**, a stylus **111**, and/or an eraser **113**. Processing device **118** can be an integrated component of the electronic whiteboard **112**, or processing device **118** can be an external component, for example a processing device capable of running electronic whiteboard operating systems, drivers, software or specific application software including an ordered listing of executable instructions for implementing logical functions. Such instructions can be utilized in any computer-readable medium for use by or in connection

with an instruction execution system, apparatus, or device, such as a computer-based system, processor-containing system, or other system that can fetch the instructions from the instruction execution system, apparatus, or device and execute the instructions. In the context of this document, a "computer-readable medium" can be any means that can contain, store, communicate, propagate, or transport the program for use by or in connection with the instruction execution system, apparatus, or device. The computer readable medium can be, for example but not limited to, an electronic, magnetic, optical, electromagnetic, infrared, or semiconductor system, apparatus, device, or propagation medium. More specific examples (a nonexhaustive list) of the computer-readable medium would include the following: an electrical connection (electronic) having one or more wires, a portable computer diskette (magnetic), a random access memory (RAM) (electronic), a read-only memory (ROM) (electronic), an erasable programmable read-only memory (EPROM or Flash memory) (electronic), an optical fiber (optical), and a portable compact disc read-only memory (CDROM) (optical). Note that the computer-readable medium could even be paper or another suitable medium upon which the program is printed, as the program can be electronically captured, via for instance optical scanning of the paper or other medium, then compiled, interpreted or otherwise processed in a suitable manner if necessary, and then stored in a computer memory. In addition, the scope of an embodiment of the present invention includes embodying the functionality of the preferred embodiments of the present invention in logic embodied in hardware or software-configured mediums.

Interactive displays, for example electronic whiteboards **112** are known in the art and can receive input from a user in a variety of ways. For example, electronic whiteboards **112** can incorporate capacitance technology and receive input from a user via an electrically conductive stylus. The stylus **111** can be a writing implement including a finger. An exemplary stylus **111** can transmit a signal to electronic whiteboard **112** indicating the location of the stylus **111** in relation to a surface of the electronic whiteboard. The stylus **111** can also transmit other information to electronic whiteboard **112** including but not limited to pen color, draw or erase mode, line width, font or other formatting information.

In another embodiment, electronic whiteboard **112** can include a touch sensitive or pressure sensitive surface **114** for receiving input. Touch sensitive or pressure sensitive

means having the capability to convert a physical contact into an electrical signal or input. Touch sensitive electronic whiteboards can incorporate resistive membrane technology. See for example U.S. Patent No. 5,790,114 to Geaghan et al. describing resistive membrane electronic whiteboards and which is incorporated herein in its entirety.

Briefly, electronic whiteboard **112** can have two conductive sheets physically separated from one another, for example by tension or a deformable conductive foam, such that the two sheets contact each other in response to a touch or physical pressure. The sheets can be made of a conductive material or can be coated with a conductive material such as a conductive film, and can themselves be deformable. Touching, writing, or other application of pressure on the surface of the conductive sheets causes contact between the two conductive sheets resulting in a detectable change in voltage or resistance. The sheets can act as resistance dividers and a voltage gradient can be created by applying different voltages at the edges of a sheet. The change in voltage or resistance can then be correlated to a location value, for example a Cartesian coordinate set. Coordinate data, for example (x,y) pairs or their equivalent can be transmitted to processing device **118**, for example in compatible data packets.

The location information can be transmitted or relayed to processing device **118**, such as a personal computer, for processing, manipulating, editing, or storing. Conventional dry-erase markers are typically used to write on a surface **114** of electronic whiteboard **112**, but any erasable, removable ink, or permanent pigment, or coloring can be used to physically mark a surface **114** of electronic whiteboard **112**. The physical markings on electronic whiteboard **112** can be removed using conventional methods including an eraser **113**, towel, tissue, hand, or other object that physically removes the markings from the surface **114** of electronic whiteboard **112**.

Electronic whiteboard **112** can also include a control area **120**. Control area **120** can contain multiple control areas for controlling a function of the electronic whiteboard system **110**. Control area **120** can be an actuator, for example a physical button, that can be actuated by applying pressure to the control area. The function of control area **120** can be fixed or variable. If the function of control area **120** is variable, control area **120** can comprise a soft key whose function can be controlled by processing device **118**. For example, a soft key can have different functions depending on different application software

running on processing device **118**. An image or icon can be projected near control area **120** indicating the current function of a soft key using a projector **116**.

Projector **116** can be operatively connected to electronic whiteboard **112** or processing device **118**, or both. Projector **116** can be a conventional projecting device for projecting a graphical user interface typically on a display monitor of computing device **118** onto a surface **114** of the electronic whiteboard **112**. Projector **116** can adjust for image distortions including keystoning and other optical problems, for example optical problems arising from the alignment of an image on projected on surface **114** with the graphical user interface on display. Alternatively, processing device **118** can adjust the image or correct alignment problems. A user can physically adjust projector **116** to compensate for image problems including keystoning.

Figure 2 is a diagram of an exemplary support frame **200** for the interactive display system **110**. One embodiment of the support frame or stand **200** includes at least one vertical support **202**, preferably two vertical supports **202**. Vertical support **202** can be of a fixed length or have an adjustable length and is connected at the lower end to a base element **204**. Base element **204** has a plurality of mobile elements **206** to facilitate the movement of interactive display system **110**. Suitable mobile elements include, but are not limited to, wheels, castors, rollers, treads, and the like. Mobile elements **206** can be hingedly mounted onto base element **204** to allow each wheel to fold or swivel inward towards electronic whiteboard **112**. Alternatively, base element **204** can be collapsible such that mobile elements **206** fold inward towards support **202**.

Two or more vertical supports **202** can be connected by at least one horizontal support **210, 208**. Lower horizontal support **208** can include a shelf element **209** having a planar surface substantially parallel to a floor surface. Additionally, lower support **208**, shelf element **209**, and base element **204**, or a combination thereof can be weighted or manufactured with dense material to provide support frame **200** with a low center of gravity to help reduce tipping. In one embodiment, support frame **200** is weighted or manufactured such that support frame **200** can tip up to about 20 degrees, preferably 10 degrees from the vertical axis without falling over.

In another embodiment, vertical support **202** contains a hollow recess or channel for receiving and/or housing vertical positioning element **212**. Figures 3A-C show an

exemplary vertical position element **212** which can be a hydraulic or pneumatic device such as a piston or spring, for example a gas spring, that can extend or contract. Hydraulic and pneumatic pistons and gas springs are known in the art, and are commercially available (Service Plus Distributors, Inc. 1900 Frost Road, Suite 101 Bristol, PA). A gas spring can be a hydropneumatic adjusting element, consisting of a pressure tube, a piston rod with piston and appropriate connection fittings. It is generally filled with compressed inert gas such as nitrogen, which acts with equal pressure on differently dimensioned cross-sectional areas of the piston. This produces a force in the extension direction. This extension force can be exactly defined within physical limits through the appropriate selection of the filling pressure.

Accordingly, vertical positioning element **212** can be calibrated to compensate or counterbalance the weight of a mounted interactive display such as an electronic whiteboard **112** such that mounted electronic whiteboard **112** can be positioned vertically on the disclosed support frame **200** by applying minimal pressure, such as finger pressure. In one embodiment, the vertical positioning element **212** is calibrated to apply an upward force or lift to interactive display **112** to counterbalance the downward force caused by the weight of the interactive display **112**, for example electronic whiteboard **112**. One or a plurality of vertical positioning elements **212** supply enough force to counterbalance of weight of at least about 200 lbs., preferably at least about 100 lbs., even more preferably from about 50 lbs. to about 200 lbs. The amount of force supplied by vertical positioning element **212** can be adjusted to vary the height of the interactive display **112**. In another embodiment, vertical positioning element or elements **212** apply sufficient counterbalancing force so that interactive display **112** can be vertically repositioned on the disclosed support frame by a single user applying finger pressure to interactive display **112.** For example, a user can vertically adjust the position of an electronic whiteboard **112** by actuating vertical positioning element **212**, for example releasing a positioning clamp or gas spring lock, and applying a force of less than about 25 pounds, preferably about 1.0 ounce to about 3 pounds of force to electronic whiteboard **112**. Once electronic whiteboard **112** is in a desired position, the user can immobilize electronic whiteboard **112** by tightening fastener **214**.

When support frame **200** includes more than one vertical support **202** each having a vertical positioning element **212**, a single actuator, for example a pedal **502**, button, or switch, can be used to simultaneously actuate the vertical positioning elements **212**, for example to release a positioning clamp to allow the positioning element to extend. Such extension or contraction can be accomplished, for example, using telescoping elements. Alternatively, vertical positioning element **212** can itself function as vertical support **202**.

At least one mounting bracket **302** is affixed to vertical positioning element **212**. Mounting bracket **302** is typically secured to the upper end of positioning element **212**. A lower mounting bracket **304** can optionally be used and is generally secured to the lower end of positioning element **212**. Mounting brackets **302** and **304** are configured to receive interactive display **112**. For example, electronic whiteboard **112** can include a recess for matingly engaging mounting brackets **302** or **304**. Alternatively, one or more separate mounting brackets can be secured to the electronic whiteboard **112**, and these separate mounting brackets can be secured to one or more upper mounting brackets **302**. Mounting brackets **302** or **304** can be fastened directly to interactive display **112** or to a mounting bracket secured to interactive display **112** using conventional fasteners including but not limited to screws, nuts, bolts, clamps, pins, buckles, braces, and the like.

Figures 4A and 4B show another embodiment of support frame **200** having a power source or supply **108** as seen from the front and back respectively. Power source or supply **108** can include one or more power cells, including but not limited to standard "D" cell batteries. It will be appreciated by those of skill in the art that any suitable power source or cell can be used in conjunction with the disclosed including conventional batteries, or a rechargeable power source including, but not limited to, rechargeable batteries such as nickel metal hydride (NiMH) batteries. The rechargeable power source can optionally include a recharging element **403**. Recharging elements are known in the art and are commercially available.

Alternatively, power supply **108** can include a fuel cell such as a hydrogen fuel cell. Suitable conventional batteries include alkaline batteries using an hydrous alkaline solution as an electrolyte. For example a manganese-dioxide primary cell with potassium hydroxide as an electrolyte can be used. During cell discharge, the oxygen-rich

manganese dioxide is reduced and the zinc becomes oxidized while ions are being transported through the conductive alkaline electrolyte.

Power supply **108** includes standard power connections **402** for providing electrical power to interactive display system **110**. Alternatively, interactive display system **110** can be in electrical communication with power supply **108** via support frame **200**. In another embodiment, power supply **108** can be recharged via a connection **404** to a standard wall power outlet. It will be appreciated that power supply **108** can be in any geometric shape. One embodiment provides a power supply **108** having a projection on an outer surface for fitting into a channel or recess of vertical support **212**. The width of power supply **108** can be conformed to the width of vertical support **212**, and power supply **108** can be secured to vertical support **212** by inserting the projection into the channel of vertical support **212**. Once fitted into position on vertical support **212**, power supply **108** can be further secured using conventional fasteners.

Power supply **108** also includes a status indicator **106** for communicating stored power levels to a user. For example, power supply **108** can include a LED display **106** that can be color-coded to indicate the level of stored power. Power supply **108** can be positioned on or within support frame **200** such that the power level indicator **106** is visible when interactive display **112** is viewed from the front. For example, power supply **108** can be mounted onto or within vertical support **202** exposing the power level indicator **106** below the bottom edge of interactive display **112**. In still another embodiment, power supply **108** can be housed within a vertical or horizontal support and a battery charge level indicator **106** can be displayed on the front of interactive display **112**.

Figures 5 is a diagram of an exemplary support frame having a plurality of vertical positioning elements **212** which can be individually mounted to an interactive display, for example a touch-sensitive display such as an electronic whiteboard **112**. Mounting brackets **504** are affixed to vertical positioning elements **212** to receive an interactive display, for example a touch-sensitive display. In this embodiment, vertical positioning elements **212** include hydraulic or pneumatic devices such as gas springs. Positioning elements **212** are calibrated to provide a counterbalancing force to the weight of the interactive display and can be actuated by pedal **502**. Accordingly, positioning

elements **212** are collectively or independently calibrated to counterbalance a weight of about 50 to about 200 lbs, preferably about 25 to about 75lbs. Lower horizontal support **208** connects vertical positioning elements **212**. Base elements **206** having a plurality of wheels, rollers, or castors **206** are mounted onto opposite ends of horizontal support **208** by substantially flat arms **204**. A power supply **108** can be mounted within or on horizontal support **208** to power the touch-sensitive display.

Figure 6 is a diagram of an embodiment having adjustable roller arms **604**. Support frame **600** includes a horizontal support **208** having a plurality of rollers **206** mounted on opposite ends of horizontal support **208**. Rollers **206** are mounted to roller arms **604**. Two roller arms **604** are mounted on either end of horizontal support **208** and pivot about the end of horizontal support **208** to adjust the distance between rollers **206**. For example, two rollers **206** can be collapsed together towards horizontal base element **208** for storage. Preferably, each roller arm **604** can pivot so that the angle between two contiguous roller arms **604** ranges from about 0 to greater than about 180 degrees. Typically, the angle between roller arms **604** will be adjusted, for example increased to about 60 to about 180 degrees, to prevent tipping of stand **600**. It will be appreciated that roller arms **604** can be locked in place when the desired degree of separation between rollers **206** is achieved. Support frame **600** also includes horizontal support **606** configured to receive electronic whiteboard **112**. Horizontal support **606** connects vertical positioning elements **212**.

Support stand **700** shown in Figure 7 includes a single vertical positioning element **212** extending vertically from lower horizontal support **208** to upper horizontal support **704**. Non-extendible vertical supports **702** provide a guide for upper horizontal support **704** by extending through openings on opposite ends of upper horizontal support **704**. An interactive display including a touch-sensitive display such as electronic whiteboard **112** can be mounted on horizontal support **704**. The vertical position of interactive display **112** can be adjusted by actuating vertical positioning element **212** for example by releasing a lock on vertical positioning element **212**. Support stand **700** also includes roller arms **204** which are hingedly mounted to an end of horizontal support **208**. Thus, rollers **206** can be folded inward towards horizontal support **208**. Horizontal support **208** can also include power supply **108** therein.

It should be emphasized that the above-described embodiments of the present invention, particularly, any "preferred" embodiments, are merely possible examples of implementations, merely set forth for a clear understanding of the principles of the invention. Many variations and modifications may be made to the above-described embodiment(s) of the invention without departing substantially from the spirit and principles of the invention. All such modifications and variations are intended to be included herein within the scope of this disclosure and the present invention and protected by the following claims.